www.PapaCambridge.com

CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

0445 DESIGN AND TECHNOLOGY

0445/31 Paper 3 (Resistant Materials), maximum raw mark 50

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

		- 2	
Page 2	Mark Scheme	Syllabus	2
	IGCSE – October/November 2013	0445	100

Section A

- 1 (a) Speed, [repetitive] accuracy, shape could not be marked out with traditional tools
 - (b) Coping saw, fret saw, Hegner saw, scroll saw or equivalent

[1]

2

Product	Specific material	Reason for choice
plastic gears	Nylon	Self-lubricating
wooden rolling pin	Beech	Hardwood, hard, close-grained

4 × 1 **[4]**

3 A Countersunk head B Flat head C Round/snap head 3 x 1 [3]

4 Strips shown across the end 1 Sandwiched top and bottom with ply 1 [2] Blocks shown on both edges 1 only

5

Safety equipment	Situation where it must be worn
ear defenders	Any sensible situation involving noisy machinery or tools
gauntlets	Operations involving heat or chemicals
apron	Wide variety of workshop situations– must give specific situation

[3]

6 Pencil, marking knife, rule, try square, marking, mortise and cutting gauges 3 × 1 [3]

7 (a) vacuum forming, blow moulding, press forming/moulding [1]

(b) injection moulding [1]

			-	
Page 3	Mark Scheme	Syllabus	.0	N.
	IGCSE – October/November 2013	0445	100	

8 Wide variety includes nuts and bolts, screws, dowel, mortise and tenon, butt joint [pinned/nailed and/or screwed and glued], KD fittings

1 ve.com

9 Understanding of safe edge— it has no teeth
Used against the vertical side without removal of material

. 1 [2]

10 The copper becomes work hardened [or equivalent terms]
Annealing will soften the metal
Allowing it to be shaped

any 2 × 1 [2]

Page 4	Mark Scheme	Syllabus		V
<u>-</u>	IGCSE – October/November 2013	0445	100	

Section B

					On.
11	(a)	The	type of tools, their sizes, quantity, weight, methods of accessibility	2 × 1	Tage
	(b)	(i)	Relatively cheap compared to hardwood, hardwearing, durable, easy to work		
		(ii)	Accept any reference to pine, red wood, red/white deal, parana pine		[1]
	(c)	Cor	rtise and tenon, dowel, butt pinned and glued, lapped, dovetail, finger [comb] rect name suracy/quality of sketch of joint	1 0–3	[4]
	(d)	(i)	Jigsaw, router		[1]
		(ii)	Answers can refer to any portable power tool: trailing leads, clamping work se personal protection equipment	curely,	[1]
	(e)	Son	ne form of handle: dowel or metal tube/rod between the two ends	1	
		Nar	ned material appropriate	1	
		Cor	nstructions appropriate	1	[3]
	(f)	Met bea	chods include: pin or screw and glue flush [accept one only], rebate, grootes	ve, app	lied [3]
			ard 0–3 for each method dependent upon technical accuracy	2 × 3	[3]
	(g)	Thr	ee different size areas	0–2	
		App	propriately named materials	0–1	
		Cor	nstructions appropriate and shown clearly/accurately	0–3	[6]
12	(a)	(i)	Thermoplastic		[1]
		(ii)	Thermoplastics can be heated and shaped/formed and process repeated Thermosetting plastics can only be heated and shaped/formed once	1 1	[2]
	(b) A	ccur	acy of outline of net	0–2	
	Α	ccur	acy of position of 2 lugs	0–2	[4]
	(c)	Use	e of oven only [not strip heater/line bender] e of former/mould shown clearly with acrylic draped euracy of technical detail	1 1 1	[3]

				32	
	Page 5		Mark Scheme Syllabus	. S. V	
			IGCSE – October/November 2013 0445	200	
	(d) Description of method should include: drill a hole, insert blade of coping saw, Hegner saw or equivalent, cut out shape, file to final size		w, 3 x	Bridge	
	(e) (i) Sketch shows 2 lines bisecting to provide centre At least one tool or item of equipment named		1	[2]	
	(Acrylic clamped securely in position Additional reference to speed of drill, safety precautions	1	[2]
	.,	adeq	e safety precautions include: uate ventilation, mask to prevent breathing in fumes, es or use of barrier cream, no naked flames	3 × 1	[3]
	(g)	(i) \	vet and dry used to make the edges smooth		[1]
		(ii) p	polishing mop and compound used to polish the edges		[1]
	. ,		vercome protruding lugs the back needs to be brought away from the vertiled 1 mark for recognition of solution	wall 1	
		Tech	nical accuracy of solution to include some form of 'spacer'	0–2	[3]
13	(a)	(i) I	Mild steel, stainless steel		[1]
	((ii) /	Aluminium, brass, copper		[1]
	(i	iii) l	Do not corrode, self-finished, attractive appearance, bends easily	2 × 1	[2]

4 × 1

1

1

[4]

[4]

(b) Any 4 stages including:

Use of lubricant

Rod held securely in vice Chamfer filed on end of rod Use of die in die stock/holder

(c) Start position for end of rod

Method of cutting thread described

Hold one part of rod in position for bending

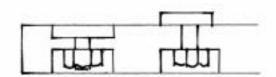
Method of force required: mallet [not hammer]

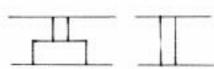
Use of former: 15mm Ø bar to bend around held securely in vice

Page 6	Mark Scheme	Syllabus	2
	IGCSE – October/November 2013	0445	100

(d)	Shows roo	d and	nut in	place = 3	marks
(a)	Snows roo	ana a	nut in	place = 3	ma

=	2	marks





[3]

(e) Face plate turning

glue hardwood block to softwood block with paper between screw block onto faceplate set up on lathe set up tee rest use of scrapers/gouges to produce shape check required diameter

Sawing from sheet/block and making round.

Mark out diagonals/circle on wood, secure to bench/flat surface, use of tenon saw to remove most waste or use of Hegner/vibro saw or equivalent, e.g. coping saw with wood held in vice, use of files and glasspaper to make round or use of sanding disc.

Award 0-4 marks	for details of main stages
Award 0-2 marks	for quality of communication

4

2 **[6]**

(f) (i) Suitable finish: varnish, oil, preservative, paint, white/French polish

[1]

(ii) Glasspaper, remove dust, glasspaper [finer grade], use of brush or rag to apply carefully along the grain, avoid 'runs' and drips 3 × 1 [3]